

**CLAIMS**

What is claimed is:

1        1. In a wireless communications network, a method in a base station to communicate

2        with a remote unit that is in a sleep mode, the remote unit having a unique identification value,  
3        comprising the steps of:

4

50        establishing a periodic reference instant at the base station and at the remote station;

6        7        8        determining a delay interval following said periodic reference instant at the base station,  
9        said delay interval being derived from said unique identification value of said remote unit; and

10        11        12        transmitting a message from the base station to the remote unit at a second instant  
12        following said delay interval, said remote unit having changed from said sleep mode to a  
standby mode after said delay interval.

1        2. The method of claim 1, wherein said base station is part of a wireless discrete  
2        multitone spread spectrum communications system.

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1        3. The method of claim 1, wherein said periodic reference instant is established by a  
2        beginning subframe count instant that is incremented by a packet count value at the base station  
3        and at the remote unit.

1        4. The method of claim 3, wherein said delay interval is determined by a value N of a  
2        quantity of M least significant bits of said unique identification value of said remote unit, the  
3        delay interval being an interval required for the occurrence of a plurality of N of said  
4        beginning subframe count instants.

1        5. The method of claim 4, wherein said remote unit changes from said sleep mode to a  
2        standby mode after said delay interval.

1           6. In a wireless communications network, a method in a base station to communicate  
2       with a remote unit that is in a sleep mode, the remote unit having a unique identification value,  
3       comprising the steps of  
4  
5       establishing a periodic reference instant at the base station and at the remote station;  
6  
7       determining a delay interval following said periodic reference instant at the base station,  
8       said delay interval being derived from said unique identification value of said remote unit;  
9  
10      attempting to initiate a communication from said base station to said remote unit;  
11  
12      concluding at the base station that the remote unit is in a sleep mode if said attempting  
13      step fails to initiate communications with the remote unit;  
14  
15      waiting for said delay interval following said periodic reference instant at the base  
16      station; and  
17  
18      transmitting a message from the base station to the remote unit at a second instant  
19      following said delay interval, said remote unit having changed from said sleep mode to a  
20      standby mode after said delay interval.

1        7. The method of claim 6, wherein said base station is part of a wireless discrete  
2        multitone spread spectrum communications system.

1        8. The method of claim 6, wherein said periodic reference instant is established by a  
2        beginning subframe count instant that is incremented by a packet count value at the base station  
3        and at the remote unit.

1        9. The method of claim 8, wherein said delay interval is determined by a value N of a  
2        quantity of M least significant bits of said unique identification value of said remote unit, the  
3        delay interval being an interval required for the occurrence of a plurality of N of said  
4        beginning subframe count instants.

1        10. The method of claim 9, wherein said remote unit changes from said sleep mode to a  
2        standby mode after said delay interval.

1        11. A highly bandwidth-efficient communications method in a base station to  
2 communicate with a remote unit that is in a sleep mode, the remote unit having a unique  
3 identification value, comprising the steps of:

4  
5 establishing a periodic reference instant at the base station and at the remote station;

6  
7 determining a delay interval following said periodic reference instant at the base station,  
8 said delay interval being derived from said unique identification value of said remote unit;

9  
10 receiving at a base station a spread signal comprising an incoming data traffic signal  
11 spread over a plurality of discrete traffic frequencies;

12  
13 adaptively despreading the signals received at the base station by using despreading  
14 weights;

15  
16 attempting to initiate a communication from said base station to said remote unit;

17  
18 concluding at the base station that the remote unit is in a sleep mode if said attempting  
19 step fails to initiate communications with the remote unit;

20  
21 waiting for said delay interval following said periodic reference instant at the base

22 station; and

23

24 transmitting at the base station to the remote unit a spread signal comprising an

25 outgoing data traffic signal spread over a plurality of discrete traffic frequencies.

1 12. The method of claim 11, wherein said base station is part of a wireless discrete  
2 ~~multitone~~ multitone spread spectrum communications system.

1 13. The method of claim 11, wherein said periodic reference instant is established by a  
2 beginning subframe count instant that is incremented by a packet count value at the base station  
3 and at the remote unit.

1 14. The method of claim 13, wherein said delay interval is determined by a value N of  
2 a quantity of M least significant bits of said unique identification value of said remote unit, the  
3 delay interval being an interval required for the occurrence of a plurality of N of said  
4 beginning subframe count instants.

1 15. The method of claim 14, wherein said remote unit changes from said sleep mode to  
2 a standby mode after said delay interval.

- 1        16. A remote unit for a personal wireless area network comprising:  
2              a receiver;  
3              an AC power supply coupled to the receiver and supplying power to the  
4              receiver;  
5              a battery-backup power supply coupled to the receiver, the battery-backup  
6              power supply becoming operative to supply power to the receiver when the AC power supply  
7              fails; and  
8              a controller coupled to the receiver, the AC power supply and the battery-  
9              backup power supply, the controller detecting when the AC power supply fails and in response  
10             controls the receiver and the battery-backup power supply by invoking a sleep mode of  
11             operation, the sleep mode operation being periodically interrupted by the controller controlling  
12             the receiver and the battery-backup power supply to enter a standby mode of operation in  
13             which the receiver scans for a CONNECT message indicating an incoming call, the controller  
14             controlling the sleep mode and the standby mode of operations based on a frame count that is  
15             generated from an identification number of the remote unit.
- 16
- 17        17. The remote unit according to claim 16, wherein the receiver scans for a connect  
18              message for a predetermined number of subframes of a TDD timing structure.
- 1        18. The remote unit according to claim 17, wherein the predetermined number of

2 subframes equals 3.

1 19. The remote unit according to claim 17, wherein when the remote unit enters the  
2 standby mode, the remote unit reacquires synchronization to the TDD timing structure.

1 20. The remote unit according to claim 19, wherein the remote unit reacquires  
2 synchronization to the TDD timing structure in about 34 subframes.

1 21. The remote unit according to claim 19, wherein the remote unit scans for a  
2 CONNECT message at a subframe that is related to an identification number of the remote  
3 unit.

1 22. A method for reducing power consumption of a remote unit in a PWAN system,  
2 comprising the steps of:

3 powering a remote unit using a battery backup power supply when an AC power  
4 supply fails at the remote unit;

5 entering a sleep mode of operation at the remote unit, the sleep mode having a  
6 reduced power consumption for the battery backup power supply;

7 entering a standby mode of operation at the remote unit a predetermined period  
8 of time after entering the sleep mode of operation

9 scanning for a CONNECT message indicating an incoming call for the remote

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10 unit; and

11 reentering the sleep mode of operation when no CONNECT message is  
12 received.

1 23. The method according to claim 22, further comprising the step of synchronizing  
2 the remote unit to a TDD timing structure before the step of entering the standby mode of  
3 operation.

1 24. The method according to claim 23, wherein the predetermined period of time is  
2 a predetermined number of subframes after a boundary subframe of the TDD timing structure.

1 25. The method according to claim 24, wherein the predetermined number of  
2 subframes is based on an identification number of the remote unit.

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